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SPECIAL REPORT

2010 Purchase of Routers With Broadband Technology Opportunity Program (BTOP) Funding



WEST VIRGINIA LEGISLATIVE AUDITOR
PERFORMANCE EVALUATION & RESEARCH DIVISION

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Issue 1: The State Misspent Federal Funds On Oversized Routers Which Could Have Been Used To Expand The State's Broadband Fiber Network.

The Office of Technology (OT) and the Broadband Technology Opportunity Program (BTOP) Grant Implementation Team (GIT) made the decision to purchase 1,164 Cisco model 3945 routers for many Community Anchor Institutions (CAIs) when smaller routers would have been appropriate for hundreds of the CAIs. The GIT was assembled in 2009 to apply for and then administer the federal grant awarded through the federal government's Broadband Technology Opportunity Program. However, according to Cisco's own literature, the model 3945 router was not an appropriate choice for the majority of the 1,164 CAIs that have or are to receive the new routers. The GIT's decision to spend the federal funds on oversized routers resulted in millions of dollars in federal funds not being spent on expanding the state's fiber optic broadband network.

Routers are generally classified by levels. Level 1 routers are typically used in single family homes and small businesses, while Level 5 routers are used at the core of the internet. The Cisco model 3945 routers are Level 3 routers. Level 1 routers would have enabled most of the state's libraries to provide quality broadband service to their communities. Level 2 routers are presently allowing State Police detachments to effectively communicate across the State Police's computer system. Level 2 routers would have allowed at least 368 West Virginia schools, which received the Cisco model 3945 routers, to meet the 2017 standards for broadband access set by the national State Educational Technology Directors Association.¹

A capacity and a users need survey, prior to the procurement of the routers, would have determined the appropriate router size for the CAIs; but, such surveys were not conducted by the GIT or the OT. Since the state's libraries and schools received the majority of the routers, the Legislative Auditor's Office focused its analysis on these entities. However, the Legislative Auditor's Office also reviewed the needs of the State Police, the Supreme Court of Appeals, and

¹*Broadband Imperative - Recommendations to Address K-12 Education Infrastructure Needs - State Educational Technology Directors Association.*

the state's 55 county governments. This included the Legislative Auditor working with the West Virginia Association of Counties to survey the 55 county governments and with the State Department of Education to survey the 55 state school districts as to their use of VoIP phone systems. Based on the Legislative Auditor's research, some conclusions can be readily drawn:

- 1) Smaller less expensive routers could have been purchased for the state's 172 libraries. If the average cost savings was \$16,265 less per router, \$2.8 million could have been saved.
- 2) Smaller less expensive routers, if even necessary, could have been purchased for the State Police for \$15,000 less per router saving \$1 million. Furthermore, if the GIT and OT had not purchased 70 of the Cisco model 3945 routers, the State would have saved approximately \$1.4 million.
- 3) Several of the State's public schools are presently able to meet the 2017 Broadband standards set by the national State Educational Technology Directors Association. In the opinion of the Legislative Auditor, routers significantly smaller than the Cisco model 3945 could have been used to ensure almost all of the State's schools meet these standards. Purchasing appropriately sized routers, which could have cost \$10,000 less, for at least the 368 schools with an enrollment less than 500 which received Cisco model 3945 routers, could have achieved the same result for \$3.68 million less.

Voice Over Internet Protocol (VoIP)

The Office of Technology asserts that the opportunity the routers provide for CAIs to save on phone bills supports the appropriateness of the router purchase. According to the State's present Chief Technology Officer, Gale Given:

Studies have shown that VoIP as compared to Public Switched Telephone Network service can save up to 40% on local calls and up to 90% on long distance calls.²

Voice Over Internet Protocol, VoIP, is a method to make phone calls using the internet. VoIP provides the method for converting analog voice communications to digital form so that it can be transmitted across the internet. VoIP enables anyone with a reasonable quality internet connection to receive phone service delivered through their internet connection instead of from the local phone company. The main benefit of VoIP is cost savings. Companies such as Vonage and Suddenlink offer consumers VoIP plans. The Legislature uses a VoIP phone system throughout its offices.

The Cisco model 3945 routers are capable of handling VoIP phone systems. In fact, according to Mark Williamson of Cisco, “VoIP is just one of the many services that the 3945 can support.”

In examining whether the Cisco model 3945 routers should have been purchased, the size of the VoIP phone system to be supported should have been one consideration. Cisco’s *Telephony Using Cisco UCM Deployment Guide* (August 2012) states:

*Because Cisco Integrated Services Routers Generation 2 (ISR G2) have different processing capabilities based on the number of phones and features applied, **it is important to select the appropriate platform based upon expected usage....***[Emphasis added.]

Table 1 shows the recommended Cisco router based upon the number of voice gateways for a VoIP system. The table also includes the list price according to a Cisco representative for the router on February 3, 2013, for comparison purposes. Cisco recommends its model 3945 routers for remote sites with 700 to 1,200 phones. Thus, the 1,164 Cisco model 3945 routers which the State purchased can support between 814,000 and 1.39 million VoIP phones. This greatly exceeds the needs of the State and its political subdivisions for which the routers were purchased.

² Given 1-24-2013 Letter From In Response to 1-17-2013 letter.pdf

Table 1 Cisco Recommendations For Appropriate Router For Voice Gateways³		
Number of Phones	Recommended Cisco Router	List Price⁴
1 – 4	881-V-K9	\$ 1,795
5 – 50	2911-VSEC/K9	\$ 4,395
50 – 100	2921-VSEC/K9	\$ 5,495
100 – 250	2951-VSEC/K9	\$ 9,395
250 – 700	3925-VSEC/K9	\$ 11,995
700 – 1200	3945-VSEC/K9	\$ 15,495
<i>Source: Cisco information see Footnotes 3 and 4 below.</i>		

Virtual Private Networks (VPN)

Cisco also recommends routers based on the number of users with regards to VPN tunnels. The Legislative Auditor examined Cisco's own recommendations in two of its publications: *Cisco Router Guide: For teleworkers, small offices, small to medium-sized businesses, and enterprise branch and head offices (Summer 2010 V.6)* and *Cisco Integrated Services Routers – Performance Overview (White Paper 2010)*. Both Cisco documents address a Cisco WebVPN feature, called SSL VPN, which allows a user to securely access resources on a corporate local area network (LAN) from anywhere with an SSL-enabled web browser. VPN is an acronym for virtual private network. Because VPN is encrypted, a router has to unencrypt the data that comes across the VPN connection or tunnel. This process uses more of a router's resources than unencrypted communications. Therefore, it is the opinion of the Legislative Auditor that a router which can simultaneously support 200 VPN users could easily support the same number of internal users. Table 2 indicates the number of VPN users each model of Cisco router is designed to support, which is a fair proxy for the number of internal users each router could support.

³ Cisco's *Telephony Using Cisco UCM Deployment Guide* (August 2012), page 4.

⁴ Cisco Systems Inc. list prices according to Mark Williamson, of Cisco, February 3, 2013 email to the Legislative Auditor.

Table 2 Simultaneous VPN Tunnel Users Supported By Cisco's Routers	
Router Model	Simultaneous Users
880	10
890	25
1921	50
1941	75
2901	75
2911	100
2921	100
2951	150
3925	200
3925E	500
3945	200
3945E	500
Source: <i>Cisco Router Guide: For teleworkers, small offices, small to medium-sized businesses, and enterprise branch and head offices (Summer 2010 V.6)</i> and <i>Cisco Integrated Services Routers – Performance Overview (White Paper 2010)</i> .	

According to one of the Legislature's network specialists, in designing either a Wide Area Network (WAN) or a Local Area Network (LAN) there has to be great consideration given to usage, bandwidth, and the critical nature of the data the network must accommodate. There must always be some extra capacity built into every aspect of every network but no network specialist would recommend network capacity to handle 100% of network maximum at all times. All users would never be accessing the network at 100% capacity simultaneously. In the normal course of daily business there are always distractions that take people away from the actual network from time to time. No user is downloading or uploading at capacity more than a few moments at a time. There should never be a time when 100% of the network users needed 100% of the rated bandwidth available for any extended period of time. The bottleneck or slowdown of the work-flow in such an extreme scenario would be the work capacity of the human beings themselves, not the network. Even in a 'mission critical' network, designing and engineering for

100% capacity to be in use 24/7 would be cost prohibitive to most if not all businesses. Furthermore, Cisco's own web site clearly states that the Cisco 3900 Series ISRs are:

*Ideal for mid-size to large deployments*⁵

and that the

*Cisco 870 Series routers are ideal for small offices, up to 20 users.*⁶

In fact, Prashanth Shenoy, the Senior Marketing Manager at Cisco stated in his corporate blog that a Cisco model 3945 router can support a 150 person branch office.⁷ The Legislative Auditor finds that libraries, State Police detachments and many schools do not meet Cisco's own criteria for mid-sized or large deployments.

Public Libraries

GIT assigned 172 public libraries in the State of West Virginia a Level 3 model 3945 Cisco branch router through the BTOP program. The Library Commission provided the Legislative Auditor with information on the number of phone lines at 105 of the state's public libraries. Ninety-one (91) of the libraries had one to three phone lines. The largest library, for which the Library Commission provided data, the Cabell County Library, had only 15 phone lines. The data with regards to public libraries' phones are shown in Table 3.

⁵ *Unified Communications on Cisco Integrated Services Routers*, on Cisco website, http://www.cisco.com/en/US/prod/voicesw/ps6790/uc_isr.html.

⁶ *Cisco 800 Series Integrated Service Router*, on Cisco website, http://www.cisco.com/en/US/prod/collateral/routers/ps380/ps6200/prod_qas0900aecd8028a982_ps380_Products_Q_and_A_Item.html

⁷ Prashanth Shenoy, *Why Cisco, Not Juniper?*, <http://blogs.cisco.com/author/PrashanthShenoy/>

Table 3 Phone Lines Per West Virginia Public Library			
# Phone Lines	# Libraries	%	Cumulative %
1	51	52.0	52.0
2	33	33.7	85.7
3	7	7.1	92.9
4	2	2.0	94.9
5	1	1.0	95.9
6	2	2.0	98.00
8	1	1.0	99.00
15	1	1.0	100.00
Total	105	100%	
<i>Source: West Virginia Library Commission as of February 7, 2013 – (unaudited)</i>			

The Library Commission also provided the Legislative Auditor with information on the number of internet user connections at each of the state's 172 public libraries. This data is shown in Table 4.

Table 4 Internet Connections Per West Virginia Public Library			
User Connections	# of Libraries	%	Cumulative %
1 – 5	26	15.1	15.1
6- 10	73	42.4	57.5
11 – 15	33	19.2	76.7
16 - 20	18	10.5	87.2
21 – 25	8	4.7	91.8
26 – 30	2	1.2	93.0
31 – 35	3	1.7	94.8
36 – 40	1	0.6	95.3
41 – 45	0	0.0	95.3
46 – 50	3	1.7	97.1
50 +	5	2.9	100
Total	172	100	
<i>Source: West Virginia Library Commission (unaudited)</i>			

As shown in Tables 3 and 4, 87% of the public libraries have 20 or fewer phone lines and 57% of the public libraries have 10 or fewer internet connections. According to Cisco's own literature, a Cisco 2911 router could easily support the future internet and VoIP needs for each of the 172 libraries at a cost of approximately \$16,265 per router less than the Cisco model 3945 router which the State purchased. If the GIT and OT had purchased Cisco model 2911 routers for state's public libraries, the state could have saved \$2.8 million.

Education⁸

According to documentation provided by the Department of Education, **338 schools currently do not meet the 2014 or 2017 recommended standards for broadband as set forth by the national State Educational Technology Directors Association.** The 2014 standard is connection speeds of at least 100 Mbps per 1,000 students and staff, and the 2017 standard is connection speeds of at least 1 Gbps per 1,000 students and staff. Reasons schools may fail to meet the standards despite the technology investment include: failure to connect the fiber to the router; an unexpired contract with a current service provider; or an inability on the part of the local school board to pay higher fees for the service contract.

Of the schools that do not meet the standards for either year, 102 (30%) have fiber completed and a Cisco model 3945 router installed from the BTOP grant. All schools that received BTOP fiber and routers that meet the 2017 standard have student populations of 100 or fewer students. Because the standards are based upon students to broadband speed ratio, a lower enrollment makes meeting the standards easier.

However, 11 schools with more than 100 students meet the 2017 standards without fiber or routers from the BTOP grant. These schools all had preexisting fiber lines, but pay higher prices for higher internet speeds than the schools who do not meet the standards. The key factor is the speed of its internet service not the size of its router.

⁸ School data was obtained from the West Virginia Department of Education and includes career centers, technical centers, alternative schools, and vocational center.

In examining the appropriateness of purchasing the Cisco model 3945 routers for 457 of the state's public schools, the Legislative Auditor examined whether the schools could meet the 2017 standards with a smaller Cisco router. For 368 of these schools, with an enrollment of 499 or less, it is the opinion of the Legislative Auditor that these schools could meet the 2017 standards with a Cisco 2951 router. As for the 89 schools which received or are scheduled to receive a Cisco model 3945 router with an enrollment of 500 or more students, the Legislative Auditor does not question the purchase of the Cisco model 3945 routers.⁹ However, if the GIT and OT had purchased 368 Cisco model 2951 routers, the State would have saved approximately \$10,000 per router or approximately \$3.68 million.

State Police

The GIT assigned 77 of the Cisco model 3945 routers to the West Virginia State Police (WVSP). On its January 31, 2013 payroll, the WVSP had 1,057 total employees, 662 of whom were sworn law enforcement officers. According to Bill Gallagher, Director of Information Technology for the WVSP, the WVSP has approximately 1,500 internet connections throughout the state. Given the size of the WVSP, the Legislative Auditor finds that the Cisco model 3945 routers were significantly oversized for the WVSP's needs. The WVSP has 67 detachments and was assigned 77 Cisco model 3945 routers. On average, one Cisco model 3945 router was purchased for every 13.7 WVSP employees and every 19.5 internet connections. Yet, as referenced earlier, the Cisco model 3945 is "ideal for mid-size to large deployments" and can support 200-plus simultaneous computer connections. The number of employees at WVSP detachments is shown in Table 5.

⁹ The Legislative Auditor notes that a capacity and users need survey should have been conducted to determine if even schools with enrollment over 500 require a Cisco model 3945 router.

Table 5 Staffing Levels at WVSP Detachments	
Employees At Detachment	Number of Detachments
1 – 5	17
6 – 10	28
11 – 15	10
16 – 20	4
Over 20	8
Total	67
<i>Source: West Virginia State Police (Unaudited)</i>	

According to Cisco's own literature, Cisco model 2921 would be a more appropriate device for the State Police detachments than the Cisco model 3945 routers which the State purchased at a cost of \$20,661 each. The Cisco model 2921's list price is \$5,495. Furthermore, according to Mr. Gallagher of the WVSP:

- 1) The WVSP conducted a study and purchased appropriate routers 4 years ago. The majority of routers purchased were Cisco model 2801s, with Cisco model 2821s for the medium sized detachments, and one Cisco model 3845 router.
- 2) The WVSP was never contacted by the BTOP Grant Implementation Team concerning the WVSP's broadband and telephone needs.
- 3) The WVSP did not ask for the Cisco model 3945 routers. Instead the WVSP were simply informed that the WVSP was receiving 77 routers.

Mr. Gallagher also informed the Legislative Auditor:

*We have deployed all of the BTOP routers as per the NTIA definition of deployed. This definition supplied to the State Police is essentially, the router is on site and received by the anchor tenant. **However only 2 of the routers assigned to the WV State Police are installed and working.** This is due to telephony needs that are not met by the 3945 routers as supplied to the WV State Police. The two which are installed and working were upgraded and paid for by the State Police to meet our telephony needs. (emphasis added.)*

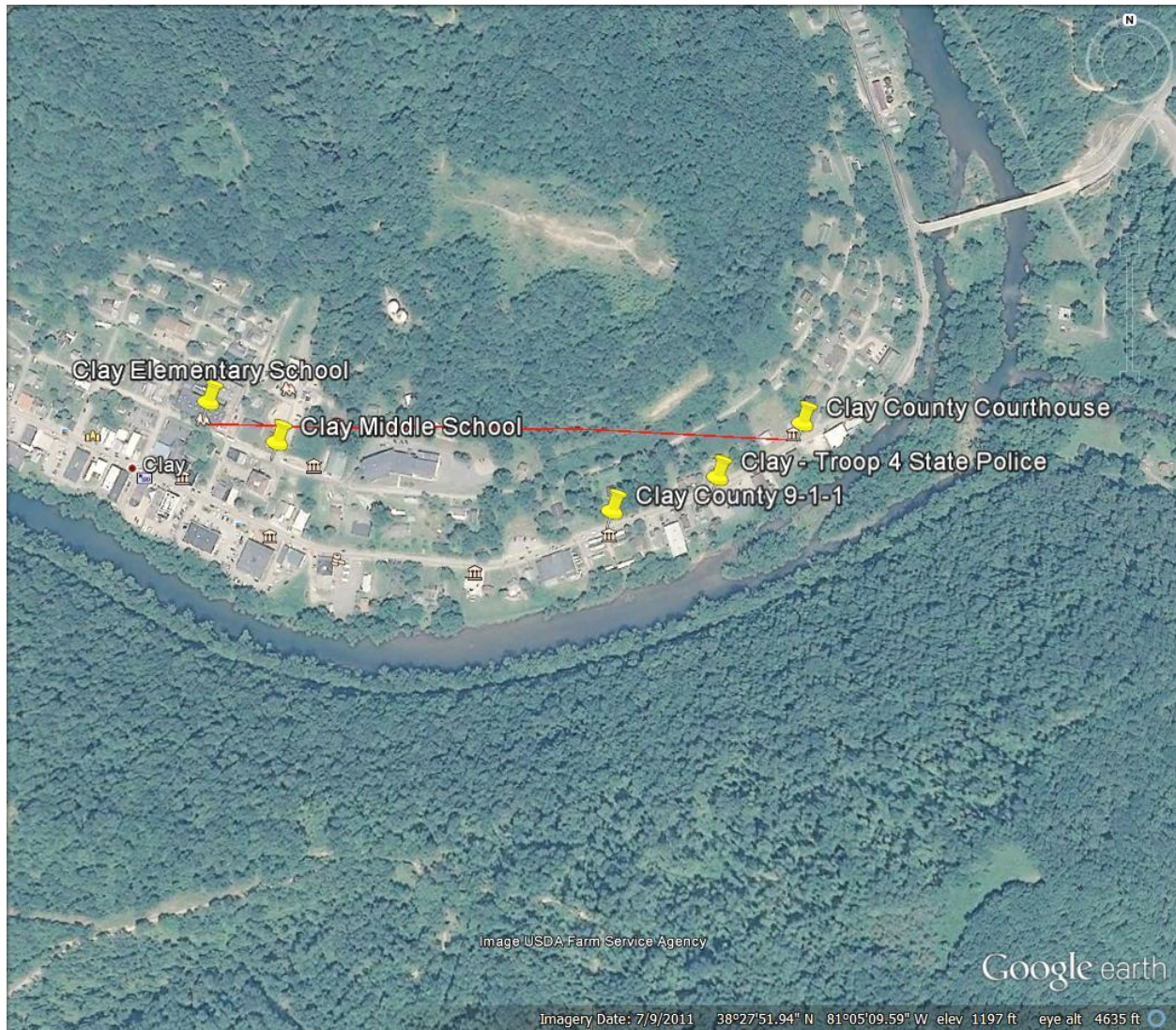
The WVSP has yet to be able to use the Cisco model 3945 routers for their VoIP system, because the Cisco model 3945 routers purchased, did not include the appropriate Cisco VoIP modules. Due to this fact, the Office of Technology has a low bid of \$84,768 to purchase the necessary additional equipment for the WVSP Cisco model 3945 routers.

It is the opinion of the Legislative Auditor that the WVSP did not need the 77 routers, given that they had conducted a study, purchased appropriate routers year 4 years ago, and are presently functioning without using 75 of the Cisco model 3945 routers. If the GIT and OT had not purchased 70 of the Cisco model 3945 routers, the State would have saved approximately \$1.4 million.

Examples of Questionable Placement of Cisco Model 3945 Routers

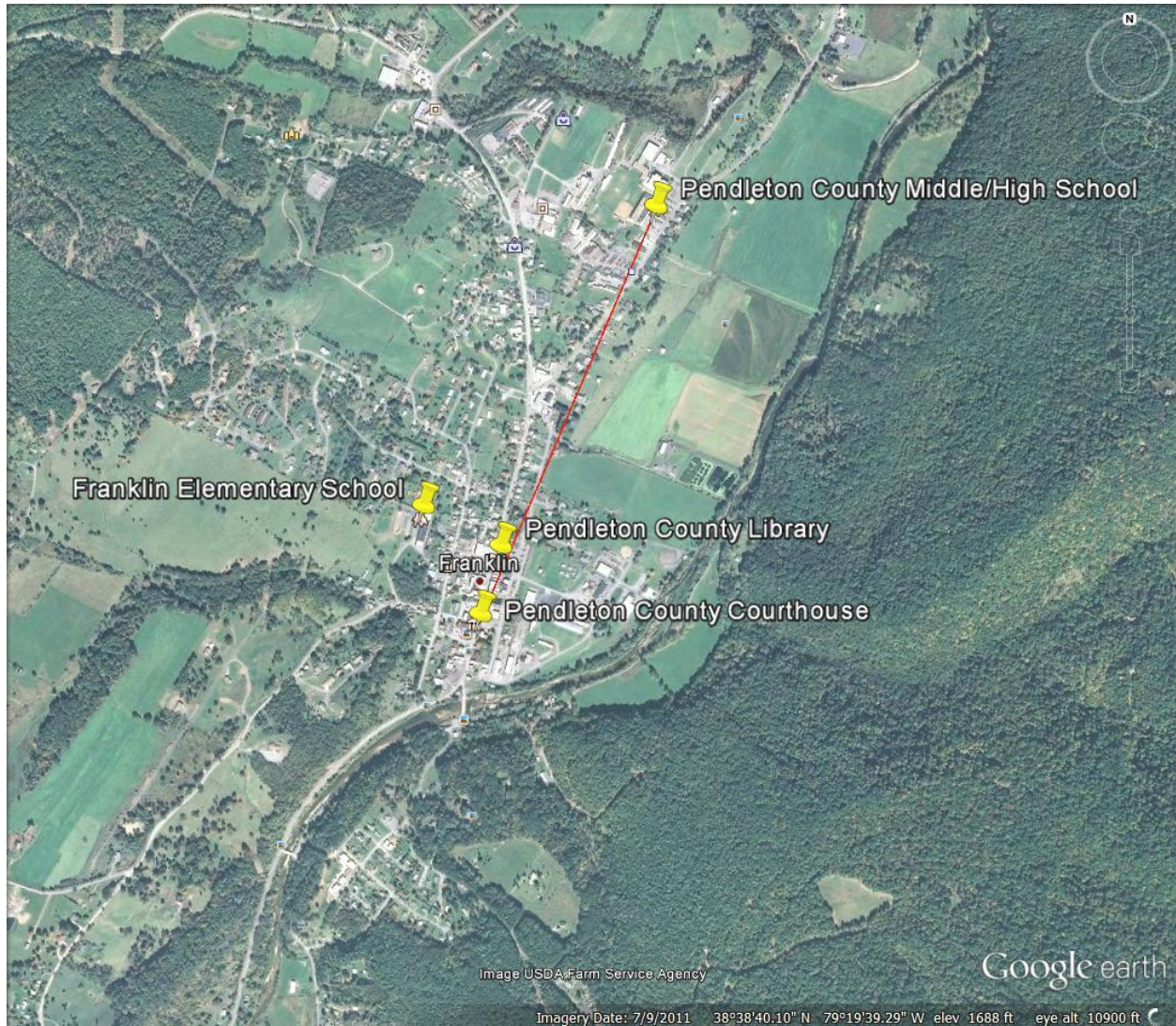
The Legislative Auditor found numerous examples of Cisco model 3945 routers being placed, not only in small facilities, but also multiple routers were concentrated in areas with small populations. The following are two examples of high concentrations of BTOP routers in communities with small populations.

The city of Clay in Clay County received 7 total routers to serve a population of 491.¹⁰ Five of these routers are located within .44 miles of the each other.



¹⁰ 2010 Census Data.

The city of Franklin in Pendleton County received 6 total routers to serve a population of 721.¹¹ Four of these routers are located within .76 miles of each other.



¹¹ 2010 Census Data.

In addition, to the high concentration of routers in small towns, the Legislative Auditor also questions the chosen locations for the routers. For example, one of the Cisco model 3945 routers was placed in the Marmet Public Library. The Marmet Public Library is an extremely small facility with only one internet connection.



However, Riverside High School which serves the Marmet area and has an enrollment of 1,244 students and multiple internet connections did not receive a router. This problem is statewide. The Legislative Auditor found 36 out of the 57 state schools with enrollment over 750 students (63%), which could most appropriately use the Cisco model 3945 routers, are not being provided a router. Table 6 shows the 36 state schools with an enrollment of 750 students which did not receive a Cisco model 3945 router.

<p>Table 6 Schools With Over 750 Students Which Did Not Receive A Cisco Model 3945 Router (As of 1-16-2013)</p>					
County	School Name	Enrollment	Current Bandwidth Mbps	Meets 2014 Standard	Meets 2017 Standard
Cabell	CABELL MIDLAND HS	1836	100	NO	NO
Wood	PARKERSBURG HS	1783	100	NO	NO
Berkeley	HEDGESVILLE HS	1691	200	YES	NO
Berkeley	MARTINSBURG HS	1685	200	YES	NO
Monongalia	MORGANTOWN HS	1616	100	NO	NO
Wood	PARKERSBURG SOUTH HS	1580	100	NO	NO
Berkeley	MUSSELMAN HS	1557	200	YES	NO
Cabell	HUNTINGTON HS	1556	100	NO	NO
Jefferson	JEFFERSON HS	1367	100	NO	NO
Monongalia	UNIVERSITY HS	1281	100	NO	NO
Kanawha	RIVERSIDE HS	1244	50	NO	NO
Kanawha	CAPITAL HS	1236	50	NO	NO
Mason	POINT PLEASANT JR/SR HS	1214	100	NO	NO
Berkeley	MUSSELMAN MIDDLE	1157	200	YES	NO
Putnam	HURRICANE HS	1142	20	NO	NO
Greenbrier	GREENBRIER EAST HS	1129	100	NO	NO
Kanawha	GEORGE WASHINGTON HS	1115	50	NO	NO
Jefferson	WASHINGTON HS	1110	200	YES	NO
Mercer	PRINCETON HS	1075	100	NO	NO
Kanawha	SAINT ALBANS HS	1070	50	NO	NO
Kanawha	SOUTH CHARLESTON HS	1036	50	NO	NO
Jackson	RIPLEY HIGH SCHOOL	962	100	YES	NO
Berkeley	MARTINSBURG S. MIDDLE	875	200	YES	NO
Greenbrier	EAST.GREENBRIER MIDDLE	865	100	YES	NO
Putnam	HURRICANE MIDDLE	865	20	NO	NO
Berkeley	BERKELEY HEIGHTS ELEM.	846	200	YES	NO
Logan	LOGAN HS	826	100	YES	NO
Putnam	WINFIELD HS	823	20	NO	NO
Monongalia	CHEAT LAKE ELEM.	812	10	NO	NO
Harrison	BRIDGEPORT HS	794	1000	YES	YES
Nicholas	NICHOLAS HS	792	45	NO	NO
Jackson	RIPLEY MIDDLE	776	100	YES	NO
Harrison	ROBERT C. BYRD HS	775	1000	YES	YES
Cabell	BARBOURSVILLE MIDDLE	771	100	YES	NO
Monongalia	MOUNTAINVIEW ELEM.	760	10	NO	NO
Kanawha	NITRO HS	755	50	NO	NO
Source: West Virginia State Department of Education (Unaudited)					

Cause

In attempting to determine the cause of the purchase of oversized routers for hundreds of facilities, the Legislative Auditor held discussions and corresponded with multiple State agencies and individuals concerning their involvement in the project. These include: members of the original GIT still employed by the State, Mr. Jimmy Gianato, Director of Homeland Security and Emergency Management Division and Lt. Colonel Michael Todorovich; the Cisco engineer for the project, Mr. Mark Williamson; Mr. David Tincher, Director of the State Purchasing Division; the present State Chief Technology Officer, Ms. Gale Given; John Dunlap with the Office of Technology; the State Department of Education; the State Supreme Court of Appeals; the State Library Commission; and, the State's former Chief Technology Officer at the time of the purchase of the routers, Mr. Kyle Schafer.

According to Mr. Gianato and Mr. Williamson, Cisco recommended the State purchase the Cisco 3945 routers because the DOE required that the routers have internal dual power supplies. Mr. Williamson informed the Legislative Auditor that:

The 3 Agencies we consulted with gave us their requirements, and we proposed a branch router platform to meet the requirements that were conveyed to us. The State ultimately selected that platform.

The Legislative Auditor then asked Mr. Williamson specifically who requested dual power supplies. Mr. Williamson stated:

That was the Dept. of Education initially (Greg Chapman and Eric Petrucci), and agreed upon by the Office of Technology (John Dunlap), and then HLS (Jimmy Gianato).

However, Mr. Williamson was unable to provide the Legislative Auditor with any emails or other documentation from the Department of Education employees showing that they asked for dual power supplies in the routers. Thus, the Legislative Auditor contacted DOE, OT, and GIT officials, including Mr. Chapman, Mr. Petrucci, Mr. Dunlap, and Mr. Gianato.

First, Ms. Brenda Williams, Executive Director of the Office of Instructional Technology and Mr. John Miller, Assistant Director of the Office of Instructional Technology representatives from the Department of Education informed the Legislative Auditor:

The Department of Education did not request or require that the routers for the state's schools have internal dual power supplies. Education would not have made this requirement because unless a school has two power sources the feature of dual power supplies would have no use. The BTOP grant implementation team did not ask Education to provide information on which schools had dual power supplies.

Mr. Petrucci, a network engineer for the DOE, informed the Legislative Auditor:

I did not request or require that BTOP purchased routers for the schools have internal dual power supplies. We have never recommended that schools use routers with dual power supplies.

Mr. Chapman, another network engineer for the DOE, informed the Legislative Auditor that to “the best of my knowledge” he did not discuss the BTOP purchased routers with dual power supplies with the BTOP Grant Implementation team.

The Legislative Auditor also contacted Mr. Dunlap, with the State Office of Technology. Mr. Dunlap stated:

It is my understanding meetings were held with various state entities including the Office of Technology to discuss router features with (Cisco representatives) Mr. Dailey and Mr. Williamson. Once these discussions were completed, they recommended the 3945 router Build of Material (BoM) to the state.

Features such as dual power supplies for 24/7/365 locations such as regional jails and DHHR state hospitals were discussed and requested. Also, discussions of possible VOIP deployments for other OT supported locations occurred but not required. It was never implied to put each feature in all routers for WVOT anchor institutions.

Mr. Williamson (of Cisco) also informed the Legislative Auditor that:

The meetings with Dept. of Education on June 14, 2010 and with Office of Technology on June 15, 2010 resulted in a series of Spreadsheets that were created, and reviewed by the State. The dual power supplies, along with the NAM, EtherSwitch, etc. were listed on every revision of those Spreadsheets that were submitted for review. This review process was done to insure that the configuration shown met their requirements. The first of those spreadsheets, created on June 16 2010 is attached. We always conduct this type of review when working with our Customers and Partners, to confirm that they are ordering exactly what they want.

The Legislative Auditor subsequently emailed Mr. Williamson tables showing Cisco's own standards for their routers and asked:

Given Cisco's own statement that 'it is important to select the appropriate platform based upon expected usage' and Cisco's own recommended standards, I would appreciate an explanation as to why you believe the 3945 routers are not oversized and misconfigured for hundreds of locations; and, thus, a significant over expenditure of millions of dollars for Cisco equipment.

Mr. Williamson (of Cisco) responded:

We based our initial recommendation on the requirements that were conveyed to us. Those requirements were Dual Power Supply, Network Analysis Module, 16-port EtherSwitch Module, 2-port T1 VWIC, and DSP's for Voice Trunk support. Those requirements were conveyed to us at the meetings on June 14, 2010 and June 15, 2010. Those requirements were captured on the initial spreadsheets, and submitted to the State for review beginning on June 17, 2010. Based on those requirements, the Branch router that can accommodate the two Service Modules and Dual Power are the 3925 and 3945. The 3925 supports two Service Modules, and therefore would have been full, so the 3945 was suggested in order to accommodate additional Service Modules in the future. The State was asked to offer any alternative configuration they saw fit. This review process was done to insure that the configuration shown accurately captured the requirements

that were discussed, and met the State's requirements. We were prepared to show any alternative configurations.

The Legislative Auditor also discussed the router purchase with Mr. Kyle Schafer, the State's former Chief Technology Officer. According to Mr. Schafer:

OT did not participate in any of the meetings that lead up to this decision. The first I saw of this purchase order was when it was sent to OT for approval. That's when I sent it back to John Dunlap for additional review. That's also when I went to (former Secretary of the Department of Administration) Ferguson with our concerns that many of these devices may be oversized based on their designated locations.

In fact, Mr. Dunlap expressed OT's concerns on July 12, 2010 in an email to Mr. Gianato and Colonel Todorovich with the routers proposed. Mr. Dunlap's email states:

Since a site assessment has not been conducted for the 1064 locations, the Office of Technology is concerned that this equipment may be grossly oversized for several of the facilities in which it is currently slated to be installed. As a result, the Office of Technology would like to evaluate these facilities and make recommendations to deploy the 3900 series routers where it may be better utilized

Mr. Schafer then met with Kelly Goes, Secretary of Commerce, on July 13, 2010. On July 13, 2010, Mr. Dunlap emailed Mr. Todorovich that "The Office of Technology will proceed with the purchase order to acquire 1064 routers..." However, Mr. Schafer's formal approval to purchase the routers is dated July 6, 2010. The Legislative Auditor notes that Mr. Schafer approved the purchase as the State's Chief Technology Officer under the authority of §5A-6-4(a)(3) of the West Virginia Code.

While Mr. Williamson of Cisco and Mr. Gianato of the GIT stated a need for the routers to have a dual power supply, the ultimate cause of the state purchasing inappropriately sized routers is that neither a capacity study nor a user need study was conducted. A capacity study of the statewide wide area network (WAN) would have identified: 1) existing network capabilities;

2) future network capacity needs, and 3) the parties responsible for each segment of the statewide WAN. A users need study would have attempted to determine present and future needs and desires from broadband for:

- 1) Voice over Internet Protocol, including the need for: 4-digit dialing, eliminating dependency on and payments to providers of long distance services;
- 2) Video streaming;
- 3) Virtual meetings;
- 4) Virtual class rooms;
- 5) Entertainment;
- 6) Mass data uploads/downloads;
- 7) Increased hard-wired internet connections; and,
- 8) Creation of wireless community broadband services.

Unfortunately, no studies were ever conducted. Furthermore, according to the State Supreme Court of Appeals and the State Police, no one from the BTOP grant implementation team ever contacted them until after the routers were purchased. Furthermore, according to the Library Commission, there were no written communications with GIT or OT regarding a need for routers.

Lt. Colonel Todorovich, a member of the GIT, informed the Legislative Auditor that he agreed with the statement:

Those making the decisions on how to spend the money did not consult individuals with technical knowledge on the best methods to utilize the funds.

Finally, inappropriately sized routers were purchased because the State Purchasing Division allowed the Office of Technology to use a purchasing process unauthorized by either statute or legislative rule. This purchasing process, as discussed in Issue 2, prevented other

vendors such as HP, Brocade, Juniper, and Alcatel-Lucent from bidding on this statewide project.

The Grant Implementation Team Purchased Over \$6.6 million Worth of Additional Features for Each Cisco Model 3945 Router

In addition to purchasing routers that are deemed to be oversized for many locations, the BTOP Grant Implementation Team also purchased \$6,667,215 worth of additional features for each of the 1,164 Cisco model 3945 routers. This was an additional cost of \$5,728 per router. Below is a brief summary of each feature. Table 7 displays the total cost for each feature.

Table 7 Additional Cisco Model 3945 Router Features	
Part	Amount
Data Paper Pak	\$540,512
T1 Card	\$1,081,024
ENCHD EtherSwitch	\$1,431,814
IP Services License Upgrade	\$1,438,305
Power Supply with power over	\$270,256
Power Supply with POE	\$540,512
Console cable – USB	\$16,215
Voice Security Bundle	\$1,348,577
Total	\$6,667,215
<i>Source: Verizon bid</i>	

The Legislative Auditor questions the need for each of these items in each Cisco model 3945 router configuration. When asked for the justification for purchasing each of the options Chief Technology Officer Gale Given stated:

The team decided to have all routers identically equipped.

As stated previously, the GIT did not conduct a user needs survey to determine whether the options were necessary currently or whether there would be a future need. Notably, the GIT purchased a Cisco voice security bundle option for each router at a total cost of \$1,348,577. The voice security bundle option would enable the router to utilize a Cisco VoIP solution if the

Community Anchor Institution purchased a VoIP system. Chief Technology Officer Gale Given justified the inclusion of the voice security bundle option by stating:

Studies have shown that using VoIP as compared to Public Switched Telephone Network Service can save up to 40% on local calls and up to 90% on long distance calls.

The Legislative Auditor agrees that in some cases, entities can save money on telephone service by switching to VoIP. However, it is unknown at this time how many of the router recipients will actually upgrade to a VoIP system. Thus, this appears to be a questionable expenditure of over \$1.3 million. As a result of the GIT not conducting its own users needs survey, the Legislative Auditor conducted a survey of the 55 County Clerks and the technology officers in each of the 55 county Board of Education offices regarding VoIP. Responses were received from 38 of the County Clerks and 32 of the county school technology officers. Seven of the County Clerks stated that their offices currently have VoIP, while 12 of the county school systems currently have VoIP. As far as future plans, 4 County Clerks responded that there are plans for VoIP in the next 5 years, while 6 county schools systems have future plans for VoIP. Thus, based on the counties that responded to the survey, a minimum of 25 County Clerks and 11 county school systems have no plans to have VoIP in the next 5 years. One County Clerk responded that they did not even know what VoIP is. Survey results are displayed in Table 8.

Table 8 Results of the Legislative Auditor's User Needs Survey for VoIP			
County Clerks Offices		County School Systems	
VoIP currently	Future plans	VoIP currently	Future plans
Cabell	Barbour	Braxton	Boone
Harrison	Hancock	Clay	Brooke
Jackson	Hardy	Doddridge	Kanawha
Kanawha	Jefferson	Gilmer	Lewis
Mercer		Hancock	Logan
Mineral		Harrison	Wirt
Randolph		Lincoln	
		Mingo	
		Monongalia	
		Pendleton	
		Pleasants	
		Upshur	
Source: Summary of survey conducted by the Legislative Auditor's Office (unaudited)			

According to a representative of the West Virginia Library Commission, there are currently no public libraries on the State library network that utilize VoIP. He further stated that the VoIP modules have no current value if the library does not have or will not have VoIP. The Legislative Auditor finds that many libraries will not have a need to utilize VoIP since many of the libraries are relatively small with few employees.

Effect

The effect of purchasing unnecessarily large routers is two fold. First, funds spent on unnecessary hardware, are funds which could have been used to build more fiber throughout West Virginia. If the BTOP implementation team overspent at least \$5 million on routers, with an average cost of \$47,860 for every mile of fiber laid, this \$5 million could have resulted in 104 additional miles of broadband fiber in the State of West Virginia. In fact, the State's current Chief Technology Officer, Ms. Gale Given, agrees with the Legislative Auditor's opinion that:

BTOP funds could have been diverted from routers to middle mile and/or other broadband initiatives with NTIA approval.

Second, the cost of maintaining the Cisco 3945 routers after the extended maintenance expires may exceed the cost of simply buying new appropriately sized routers. As discussed previously, the cost to retrofit the State Police Cisco 3945 routers with the appropriate Cisco modules to allow the model 3945s to work with the State Police VOIP system is approximately the same cost as simply buying new small routers.

Conclusion

The Legislative Auditor found that some State agencies did conduct analysis to determine router sizes prior to making purchases. For example, the State Tax Department purchased 55 Cisco model 2821 routers for installation in the 55 county courthouses. The Tax Department consulted with other State agencies as well as Verizon prior to the purchase of Cisco model 2821 routers in 2008, using the WAN08 statewide contract. Twelve of the Cisco 2821 routers were installed between December 2008 and October 2010. The Office of Technology subsequently obtained the 55 Cisco model 2821 routers from the Tax Department via the surplus property process. OT installed the Cisco model 2821 routers in multiple State agencies with more users than most of the state libraries and State Police detachments that were given the Cisco model 3945 routers. For example, OT placed one of the Cisco 2821 routers in the Martinsburg DMV office where it supports 22 users.

Another example of a State agency which was not a part of the BTOP grant program, but purchased a Cisco router to support a new VoIP system is the Secretary of State's Office. The Secretary of State's Office in July 2011 purchased a Microsoft based VoIP system to service 75 phone lines. The Secretary of State's Office purchased a Cisco model 2911 router to host their VoIP phone circuit. According to the Secretary of State's Chief Technology Officer, the Cisco 2911 router has adequately handled their VoIP phone circuit.

Furthermore, the Legislature runs its network, not with a router but instead with a switch. The Legislature has a Cisco 3560 switch acting as our 'core' switch that handles upwards of 600

wired users for both data and VoIP telephone services. The Legislature has approximately 75 fax machines on that same network and upwards of 200 wireless users on any given day during session. The Legislature's switch is uplinked to a WVnet router, in a different building on the Capitol Complex, with 100 mbps fiber. Even at the busiest time of the legislative session with over 600 inside users and a large number of external users accessing multiple web servers, up to 8 simultaneous live audio webcasts, multiple SQL servers, and multiple Google search appliances located in the Legislature's server farms, the network generally ranges around 40-50% bandwidth usage. It will burst above that during brief periods, but to the Legislature's network specialist knowledge, the Legislature never has exceeded the capacity of the switch or its connections to the WVnet router. When the Legislative Auditor asked one of the Legislature's network specialist whether he would like one of the Cisco model 3945 routers, he stated no because it greatly exceeds the Legislature's needs.

Based on Cisco's own literature's recommendation for routers and the fact that multiple State agencies that have higher capacity functions than the state's public libraries and State Police detachments, have designed and operate networks with level 2 routers or with switches, including the Legislature, and the fact that schools with 500 or less students can meet the national 2017 broadband access standards with level 2 routers, the Legislative Auditor concludes that the majority of Level 3 Cisco model 3945 routers which were purchased are unnecessary.

The Legislative Auditor believes that the Cisco sales representatives and engineers had a moral responsibility to propose a plan which reasonably complied with Cisco's own engineering standards. It is the opinion of the Legislative Auditor that the Cisco representatives showed a wanton indifference to the interests of the public in recommending using \$24 million of public funds to purchase 1,164 Cisco model 3945 branch routers.

Recommendations

1. *The State Purchasing Division should determine whether the actions or inactions by the Cisco representatives fall under the purview of §5A-3-33d of the West Virginia Code and are grounds for debarment.*
2. *The State Office of Technology should immediately conduct a Capacity/Users Need study in conjunction with the State's Broadband Deployment Council and report back to the Legislature prior to the conclusion of the 2013 Legislative Regular Session as to the results of such a study and whether it is legal to redeploy any of the Cisco model 3945 routers to more appropriate public facilities to maximize their usage. Such a study should include determining whether the state's smallest libraries even need level 2 router.*
3. *The State Office of Technology should immediately contact Cisco and the NTIA to see if the State could trade out unnecessary features/modules in the Cisco model 3945 routers which have yet to be deployed for the \$80,000 of Cisco VOIP modules necessary for the Cisco model 3945s to run the State Police's VOIP system.*

Issue 2: A Legally Unauthorized Purchasing Process Was Used To Buy 1,164 Cisco Model 3945 Routers At A Cost of \$24 Million Using Federal Stimulus Funds

The State Office of Technology used a purchasing process which is unauthorized by West Virginia statute or legislative rule to purchase 1,164 Cisco model 3945 branch routers at a cost of \$24 million on behalf of the Broadband Technology Opportunity Program (BTOP) grant implementation team. The Office of Technology used a “Secondary Bid Process” on an existing contract approved by the State Purchasing Division, instead of a competitive bid process, open to non-Cisco vendors, as required by law. In addition to using the legally unauthorized secondary bid process, the contract used to purchase the routers was an inappropriate vehicle; the 2007 IPT07D Contract with Verizon Network Integration CO was a statewide contract for a “simple expansion” of telephony.¹² However, the 1,164 Cisco routers purchased through the unauthorized process have the capabilities to support between 814,000 and 1.39 million voice over internet protocol (VoIP) telephones.

I. Background

After a request for proposal in 2007, the State of West Virginia entered into contracts with four companies in early 2008 “to establish a statewide contract for the procurement, installation, and on-going maintenance of Internet Protocol Voice (VoIP) communications equipment,” and Cisco brand products or equal were specified because “the products we are requesting for purchase are a simple expansion of a pre-existing network/telephony hardware and software platform/system architecture.”¹³ Alpha Technical Solutions, Alpha Technologies Inc., Pomeroy IT Solutions and Verizon Network Integration CO were awarded “statewide contracts” IPT07A, IPT07B, IPT07C and IPT07D, respectively. The contracts required that “any alternate products must seamlessly fit into, integrate with and

¹² See IPT07D Contract, p. 5.

¹³ See, e.g., IPT07D Contract, p. 5.

interchange with the existing Cisco infrastructure investment with zero loss of feature functionality, and no infrastructure configuration changes.”¹⁴

In 2010, 1,164 Cisco branch routers were purchased at a cost of \$24,049,957.50 from Verizon (under the IPT07D Contract) using a purchase order (known as “ISCL0002”), which, according to the Purchasing Division, utilized a secondary bid process.¹⁵ At issue is whether that purchase, and the secondary bid process itself, are legally authorized. In order to understand and evaluate the legal basis for the process used in the 2010 purchase, it is necessary to understand the statute and legislative rules that generally govern the purchasing process, as well as examine the Purchasing Division’s Handbook and documentation concerning the purchase itself.

II. Applicable Law

a. West Virginia Code, Article 3, Chapter 5A

Article 3, Chapter 5A of the West Virginia Code creates and provides for the procedures of the Purchasing Division (the “Division”) within the Department of Administration. The Division exists “for the purpose of establishing centralized offices to provide purchasing, and travel services to the various state agencies.”¹⁶ Unless specifically exempted, the provisions contained in Article 3 apply to all of the spending units of state government.¹⁷ The Division is led by a director, who has the power and duty to, among others,

(2) Ensure that the purchase of or contract for commodities shall be based, whenever possible, on competitive bid;

¹⁴ *Id.*

¹⁵ Letter from David Tinchler, CPPO, Director, Purchasing Division (January 17, 2013).

¹⁶ W. Va. Code §5A-3-1(a).

¹⁷ W. Va. Code §5A-3-1(c-d) (among others, the judicial and legislative branches are exempt from the provisions of this article). *See also* “Statutory Exemptions from the West Virginia Purchasing Division Approved by State Legislature,” available at <http://www.state.wv.us/admin/purchase/PurchasingExemptions/default.html> (for the list maintained by the Purchasing Division).

[. . .]

(9) Examine the provisions and terms of every contract entered into for and on behalf of the State of West Virginia that impose any obligation upon the state to pay any sums of money for commodities or services and approve each such contract as to such provisions and terms[. . .]; and

(10) Assure that the specifications and commodity descriptions in all "requests for quotations" are prepared so as to permit all potential suppliers-vendors who can meet the requirements of the state an opportunity to bid and to assure that the specifications and descriptions do not favor a particular brand or vendor. . . .¹⁸

The director is also required to propose rules for legislative approval to authorize a variety of purchasing methods, including direct and emergency purchases, the process for purchasing, including timelines, inspections, bonds, vendor registration, liquidated damages and cancellation provisions, contract management, oversight of purchases, surplus commodities.¹⁹ Code of State Rules, Title 148, Series 1, Department of Administration, Purchasing Division contains the rules proposed by the director and approved by the legislature. Read together, the statute and rule provide and describe the authorized methods for purchasing, of which there are several.

b. West Virginia Code of State Rules, Title 148, Series 1

I. Methods of Purchasing

1. Purchases of \$25,000 or less

¹⁸W. Va. Code §5A-3-3(2),(9),(10). This is not a comprehensive list of the director's duties, but rather those most relevant to the purchasing process at issue here. *See also* W. Va. Code. R. §148-1-4 (describing the authority and remedies of the director).

¹⁹ W. Va. Code §5A-3-4(a).

For purchases below \$25,000, the director may make those purchases on the open market, but those purchases, wherever possible, must be based on at least three competitive bids.²⁰ According to the legislative rule, “spending units may make purchases of \$25,000 or less per transaction for certain commodities, services or printing pursuant to the most current Purchasing Division procedures and requirements established by the Director,” so long as the spending units maintain records of those purchases for inspection.²¹ The director also may authorize spending unit purchases without competitive bidding for \$2,500 or less per transaction. The cost of maintenance and life of the commodity must be considered if the director determines there are nationally accepted industry standards for the commodities.²²

2. Purchases in Excess of \$25,000

Purchases estimated to exceed \$25,000 must be made by the Purchasing Division, and the director must generally solicit sealed bids, by public notice as well as by request to prospective vendors.²³

3. Open End Contracts

‘Open end contracts’ are authorized by rule for “commodities, service or printing supplies to supply the repetitive needs of the State spending units in the form of statewide contracts, blanket orders, or spending unit contracts.”²⁴ Agencies are required to use these contracts, unless granted an exemption by the director, and the director “may solicit requirements for similar commodities, services or printing to determine the best methods of acquisition.”²⁵

²⁰ W. Va. Code. R. §148-1-7.2; W. Va. Code §5A-3-11(a).

²¹ W. Va. Code. R. §148-1-7.2.

²² W. Va. Code §5A-3-11(b).

²³ W. Va. Code §5A-3-10(b); W. Va. Code R. §148-1-6, 148-1-7.3.

²⁴ W. Va. Code. R. §148-1-7.4.

²⁵ W. Va. Code. R. §148-1-7.4.

4. Sole Source Procurement

It is recognized throughout the Code that the competitive bid requirement either cannot be met in some instances, or need not be met. For example, the statute provides for situations in which competitive bidding might not be possible because there is only one source for the required commodity or service.²⁶ ‘Sole source procurement,’ which means buying from one source without advertisement or competition, is appropriate when the director determines in writing that there is only one source, and the spending unit provides appropriate documentation regarding cost or pricing and the efforts made to determine availability of other sources. Prior to any such award, registered vendors will be informed and provided an opportunity to indicate an interest in bidding on the commodity or service.²⁷ The rules discourage the use of sole source purchases, giving the director power to reject requests by agencies “whenever competition is believed to be available,” and encouraging agencies “to solicit competition rather than process a sole source request.”²⁸

5. Emergency Procurement

Similarly, the director may authorize emergency purchases of specific commodities by a spending unit which exceed \$25,000 upon written request, in the case of a bona fide emergency, such as delays by contractors, in transportation, or unanticipated work volume. Even in this situation, however, unless the requirement is waived by the director, “[c]ompetitive bids shall be obtained if possible.”²⁹

²⁶ W. Va. Code §5A-3-10c.

²⁷ W. Va. Code §5A-3-10c.

²⁸ W. Va. Code. R. §148-1-7.5.2

²⁹ W. Va. Code §5A-3-15; W. Va. Code. R. §148-1-7.6.

6. Requests for Proposals, Expressions of Interest & Best Value Procurement

Another method authorized by rule, and which requires approval of the director, is the use of requests for proposal (RFP's) or expressions of interest (EOI's), which are awarded based on criteria specified to bidders, including price (for RFP's).³⁰ The director must determine in writing whether using 'best value procurement,' meaning awarding contracts based on criteria set forth in RFP's or EOI's, is in the best interest of the state, and awards must be made to the "highest score responsive and responsible bidder whose bid is determined, in writing, to be the most advantageous to the state."³¹ Any such procurement must follow the same general process set forth for competitive bids in W. Va. Code §5A-3-10a.

7. Purchases from Contracts Issued by Other Public Agencies and Entities (known as "Piggybacking")

The director is also authorized by rule to "approve a request by a spending unit to make a purchase from contracts issued by agencies of the federal government, agencies of other states, other public bodies or other state agencies," a process commonly known as 'piggybacking.'³² The director is also authorized to make cooperative purchases under this section, but in "all cases, these contracts or cooperative agreements shall be from valid properly awarded contracts and considered by the director to be available and financially advantageous and comparable to what can be obtained by competitive bid."³³ Any spending unit wishing to piggyback must prove to the director that a) the contract would not conflict with any existing state contract, unless the prices are substantially lower than the state contract based on equal specifications, b) the contract will not cause a resident vendor to lose substantial business, unless the price difference is so great that

³⁰ W. Va. Code §5A-3-10b; W. Va. Core R. §7.7.

³¹ W. Va. Code §5A-3-10b; W. Va. Core R. §7.7.

³² W. Va. Code R §148-1-7.9; *see also* <http://www.state.wv.us/admin/purchase/piggyback/default.html>.

³³ W. Va. Code R §148-1-7.9.1.

it is in the state's best interest to piggyback, and c) that the contract would not cause extensive hardship to any spending unit offered preference under the code. The director must approve or disapprove any piggybacking.³⁴

8. Multiple Awards

The director is also authorized to award a contract to “one or more responsive and responsible bidders if the director determines in writing that a single award to an individual bidder would be insufficient: Provided, That the basis for the selection among multiple contracts at the time of purchase shall be the most practical and economical alternative and shall be in the best interests of the state.”³⁵ The written explanation of the necessity for multiple awards shall be based on several factors, and placed in the public contract file.³⁶

9. Contract Management

In addition to overseeing the purchasing process, the director's duties include prescribing “procedures by which oversight is provided to actively monitor spending unit purchases, including, but not limited to, all technology and software commodities and contractual services exceeding \$1 million, approval of change orders and final acceptance by the spending units.”³⁷ The rules provide the contract management process, which the director may prescribe, for purchases of \$1 million or less, as well as the mandatory contract management procedures for any purchase exceeding \$1 million. The latter include post award conferences, monitoring, and status and activity reports to the director.³⁸

³⁴ W. Va. Code R §148-1-7.9.1(a-c); §148-1-7.9.2.

³⁵ W. Va. Code §5A-3-11c.

³⁶ W. Va. Code R §148-1-7.10.

³⁷ W. Va. Code §5a-3-4(a)(10).

³⁸ W. Va. Code R §148-1-7.13.2.

III. The Secondary Bid Process

a. Purchasing Division Procedures Handbook

According to the Director of Purchasing, the 1,164 Cisco branch routers from Verizon (the “IPT07D Contract”) were purchased under a purchase order, which utilized a secondary bid process.³⁹ The ‘secondary bid process’ is not specifically referenced or defined in either the Code or the Rules. The document entitled “Purchasing Division Procedures Handbook,” currently defines the process as:

A subsequent bidding process for commodities and services included in an existing contract that is required as part of the original terms and conditions. Participation in this secondary bid process is restricted to the pre-approved, certified vendors for the existing contract.⁴⁰

The handbook further states that “some statewide or open-end contracts may require a secondary bid process,” and refers agencies to the ordering procedures on statewide contracts for proper instructions.⁴¹

In addition to several Code and Rule sections, discussed below, the Director of Purchasing points to the Handbook’s definition of the secondary bid process to explain a transaction that took place in 2010.⁴² The term secondary bid process did not appear in the Handbook, however, until a revision on December 15th, 2011.⁴³ **The Handbook in effect at the time of the ISCL0002 branch router purchase on July 15, 2010, contained no reference to the term “secondary bid**

³⁹ Letter from David Tincher, CPPO, Director, Purchasing Division (January 17, 2013).

⁴⁰ Purchasing Division Procedures Handbook, 2.1 (Issued July 1, 2007, Revision 19 (November 27, 2012)).

⁴¹ *Id.*, 4.7.2.1.

⁴² Letter from David Tincher, CPPO, Director, Purchasing Division (January 2, 2013).

⁴³ Purchasing Division Procedures Handbook, Revision 15 (December 15th, 2011).

process.”⁴⁴ Instead, the Handbook merely directed agencies to refer to ordering procedures on all statewide contracts for proper instructions.⁴⁵

Further, the portion of the Handbook which eventually contained reference to the secondary bid process appears to fall under the section concerning Open-End Contracts, specifically, for ‘releases’ required to order commodities or services under the contract entitled: **“Requiring Purchasing Division Approval.”**⁴⁶ In response to a request for information by the Legislative Auditor, the Director of Purchasing unequivocally stated as follows:

*As previously stated, the Purchasing Division was not required to review requirements or bids and/or approve purchase orders processed from the secondary bid process. Accordingly, the Purchasing Division had no knowledge of the \$24 million router purchase order awarded through the secondary bid process.*⁴⁷

As noted above, the secondary bid process is not defined within the Code or the Rules. Further, the Handbook, even in its current form, does not contain any more detailed instructions about the secondary bid process, including who has the authority to approve the use of the process, what criteria should be used to judge the appropriateness or benefit to the state of using the process, and what type of purchases may be made using the process. According to the Director:

*[a]pprovals required to award a purchase order from the secondary bid process vary depending on the requirements contained in the master contract [...and] may include **only the ordering agency**, or they may include a combination of the ordering agency, the Purchasing Division, the West Virginia Attorney General’s Office and any agency that is statutorily required to approve a purchase.*⁴⁸

⁴⁴ Purchasing Division Procedures Handbook, Revision 9 (April 1, 2010).

⁴⁵ *Id.*, at 4.7.1.2.

⁴⁶ Purchasing Division Procedures Handbook, Revision 15, at 4.7.1.2.

⁴⁷ Letter from David Tinch, CPPO, Director, Purchasing Division (January 29, 2013) (emphasis in original).

⁴⁸ Letter from David Tinch, CPPO, Director, Purchasing Division (January 2, 2013) (emphasis added).

This appears to differ from the Handbook, which implies that purchases using a secondary bid process require Purchasing Division Approval. It appears that once a ‘master contract’ is approved, the terms of that contract, as well as the vendors selected in that process, control the secondary bid process and any subsequent purchases, for as long as the contract remains in effect.⁴⁹ It is the opinion of the Legislative Auditor that the secondary bid process subverts the requirements of the purchasing statute and diminishes government oversight of procurement, thus jeopardizing the public trust and faith in good government.

Finally, it should be noted that after repeated inquiries from the Legislative Auditor concerning the 2010 branch router purchase and the secondary bid process, the Director of Purchasing plans to again revise the Handbook to implement a new procedure for the secondary bid process. Specifically, effective February 1, 2013, ‘releases’ to order commodities or services from open-end contracts may be released directly by the agency if the purchases are anticipated to cost \$250,000 or less, meaning those purchases may be made without advance Purchasing Division approval. When a secondary bid process is required, and the purchase may exceed \$250,000, agency procurement officers must send a memorandum for original approval to the Purchasing Division including a synopsis of the purchase, the items, the possible participating vendors, and the anticipated amount. After the secondary bid process is conducted, the agency must submit similar evidence regarding the proposed award to the Purchasing Division for approval, after which point it may be processed. The statutory authority for this process, whether in its current form, or in the form proposed by the Director for implementation after February 1, 2013 is unclear, for the reasons described below.

b. The West Virginia Code and Code of State Rules

The Purchasing Division points to W. Va. Code §5a-3-11c, which allows the award of multiple contracts. The code authorizes the director to award a contract to “one or more

⁴⁹ Purchasing Division Procedures Handbook, Revision 19, 4.7.2.1.; Letter from David Tincher, CPPO, Director, Purchasing Division (January 17, 2013); Letter from David Tincher, CPPO, Director, Purchasing Division (January 2, 2013).

responsive and responsible bidders **if the director determines in writing that a single award to an individual bidder would be insufficient**: Provided, That the basis for the selection among multiple contracts at the time of purchase shall be the most practical and economical alternative and shall be in the best interests of the state.”⁵⁰ The written explanation of the necessity for multiple awards shall be based on several factors, and placed in the public contract file.⁵¹ Based on the documentation described as the BTOP router contract file, no such written explanation was placed in the file. Further, no documentation was provided indicating that any agency provided any written justification for a request to use multiple vendors.⁵² Additionally, the code requires that any later selection among multiple vendors for purchase must be “the most practical and economical alternative and shall be in the best interests of the state.”⁵³

It appears that the Purchasing Division’s interpretation of this statute would allow for use of ‘the secondary bid process’ for subsequent purchases under the contracts awarded to multiple vendors. This interpretation, however, assumes that the contracts awarded under the multiple award process are not subject to the other requirements of the code. First, the director points to W. Va. Code §5A-3-4(1) [sic] which according to his letter of January 2, 2013 “authorize[s] the director to . . . authorize a spending unit to purchase commodities directly and prescribe the manner in which such purchases shall be made.” In fact, that section requires that the director “shall **propose rules for legislative approval** . . . [to a]uthorize a spending unit to purchase specified commodities directly and prescribe the manner in which such purchases shall be made.”⁵⁴ As noted above, those legislatively-authorized rules *do* provide for the direct purchase of commodities under certain circumstances, but *do not* appear to provide for a secondary bid process. Similarly, the director points to W. Va. Code §5A-3-4(3) [sic] and CSR 148-1-4.3, which “authorize the director to . . . prescribe the manner in which commodities shall be purchased.” That subsection also refers to the director’s duty to propose rules to prescribe the manner in which purchases should be made. Under the Purchasing Division’s interpretation, this

⁵⁰ W. Va. Code §5A-3-11c.

⁵¹ W. Va. Code R §148-1-7.10.

⁵² W. Va. Code R §148-1-7.10.2.

⁵³ W. Va. Code §5A-3-11c.

⁵⁴ W. Va. Code §5A-3-4(a)(1).

subsection would authorize an otherwise non-legislatively-approved method of purchase (such as the secondary bid process), and would provide unlimited discretion to the purchasing director to make procurements in any way he wishes. It is the opinion of the Legislative Auditor that the totality of the code and the rules indicate that this was not the intent of the legislature. Rather, the purchasing director has the authority to propose rules for legislative approval prescribing the manner in which purchases shall be made, in accordance with the code. **Those rules do not include the secondary bid process.**

Finally, the director points to W. Va. Code §5A-3-11(e), which requires that “awards for open market orders, purchases based on advertised bid requests or contracts made by the director or a state department shall be awarded to the lowest responsible bidder or bidders.” The fact that this requirement is included actually strengthens an alternative to the Purchasing Director’s interpretation of the ‘multiple award’ section – that any award made under that section remains subject to the other requirements of the code – because if purchases based on multiple awards could be made using a secondary bid process, in essence exempting them from the other requirements of the code, this requirement would not apply.

Based on a comprehensive analysis of the Code and the rules by the attorneys of Legislative Services, and based upon their advice, it is the opinion of the Legislative Auditor that the “multiple awards” section does not authorize a secondary bid process, but is rather a method by which the director may award multiple contracts, each of which is nonetheless subject to the other requirements of the Code for purchases of whatever type the original contract was intended to make.

Further, it does not appear that the use of a secondary bid process is consistent with the Legislature’s stated purpose of the purchasing statute:

The Legislature of the State of West Virginia hereby declares that the purpose of this statute is to promote equal and fair bidding for the purchase of commodities

*by the State and any political subdivision of the State purchasing commodities under any state contract; to eliminate fraud in the procurement of commodities by the state.*⁵⁵

It appears to the Legislative Auditor that in this instance the use of the secondary bid process took place wholly outside the control of the State Purchasing Division. The 2010 branch router purchase was inconsistent with the specific requirements of the purchasing statute. Had this purchase been competitively bid, the Purchasing Division would have administered the bidding process and provided contract management. In addition to exempting purchases from Purchasing Division scrutiny, the secondary bid process, as applied to the BTOP router purchase, appears to have the effect of limiting competition for future purchases to only those vendors on the original contract

IV. The 2010 Purchase

The State of West Virginia entered into contracts with four companies, including Verizon, in early 2008 “to establish a statewide contract for the procurement, installation, and on-going maintenance of Internet Protocol Voice (VoIP) communications equipment,” and Cisco brand products or equal were specified because “the products we are requesting for purchase are a simple expansion of a pre-existing network/telephony hardware and software platform/system architecture.”⁵⁶ The contracts required that “any alternate products must seamlessly fit into, integrate with and interchange with the existing Cisco infrastructure investment with zero loss of feature functionality, and no infrastructure configuration changes.”⁵⁷

In 2010, the State purchased 1,164 Cisco routers from Verizon Network Integration Co., at a cost of \$24,049,957.50 under the IPT07D Contract, using “Purchase Order ISCL0002.”⁵⁸ This purchase was made under a ‘secondary bid process,’ which it appears was open only to the

⁵⁵ W. Va. Code §5A-3-30(a).

⁵⁶ *See, e.g.*, IPT07D Contract, p. 5.

⁵⁷ *Id.*

⁵⁸ ISCL0002, p.1.

vendors originally awarded the IPT07 contracts. In addition to containing no reference to routers, the original IPT07 contracts specifically requested bids for “Cisco name brand product(s), “or equal”.”⁵⁹ The release document for the 2010 purchase, however, stated that the “IPT07SWC [statewide contract] specifies Cisco equipment only.”⁶⁰ Accordingly, it appears that, in addition to limiting the pool of bidders to those holding an IPT07 contract, only those bidders who could provide Cisco products were eligible to bid on the ISCL002 release.

According to the Director of Purchasing, the Purchasing Division, a division within the Department of Administration, did not approve the decision to use the secondary bid process to make the 2010 router purchase under the IPT07D contract. The contract administrator for the IPT07D contract was the State Office of Technology,⁶¹ also within the Department of Administration, which is the office responsible for evaluating and approving technology purchases.⁶² In the case of the 2010 purchase, the statutory intent of several code requirements for a proper award was not met. First, the purchase exceeded \$25,000, and thus should have been made by the Purchasing Division. It appears that only the Office of Technology approved the \$24 million purchase. Second, the process should have been based upon a more open competitive bid process. In 2007, the Purchasing Division conducted a prequalification process and prequalified four vendors to bid on “a statewide contract for procurement, installation, and on-going maintenance of Internet Protocol Voice (VoIP) communications equipment.”⁶³ The responses did not contain estimated prices or a list of the specific equipment or services to be provided. In 2010, only the four prequalified vendors were given notice and an opportunity to bid on the BTOP router purchase. Two of those vendors, Pomeroy and Verizon, submitted bids. It is not clear whether a determination was made that using a limited set of vendors met with the requirements of the code. This is likely because a secondary bid process was used, and that process does not appear to have any criteria for determining the appropriateness of its use.

⁵⁹ IPT07D Contract, p.5.

⁶⁰ ISCL0002, p. 14.

⁶¹ Tincher Letter (January 17, 2013).

⁶² W. Va. Code §5A-6-4, *et seq.*

⁶³ IPT07D, p. 5.

Finally, because the contract well exceeded \$1 million, contract management procedures should have been followed.

Conclusion

The process used to purchase the Cisco routers was not equal, fair or consistent with the intent of the purchasing statute. The Legislature has declared that its intent is “to promote equal and fair bidding” and “to eliminate fraud.”⁶⁴ Vendors of non-Cisco branch routers such as HP, Brocade, Juniper, and Alcatel-Lucent were not given notice or any opportunity to bid on the statewide expansion of broadband. Because the secondary bid process excluded all other branch router makers, the state cannot be certain that it received the best possible price for the routers, including the lowest possible price Cisco was willing to offer through its partner vendors. For example, in 2012, California State University, the largest four year university in America, used a competitive bidding purchase to purchase an eight year refreshing of its 23-campus 10G network. The Director of Cyber Infrastructure of California State University provided documentation showing that Alcatel-Lucent won the project with a bid of \$22 million. Cisco’s bid was \$122.8 million. The other bids were Brocade at \$24 million, Juniper at \$31.6 million, and HP at \$41 million.⁶⁵ Furthermore in May of 2011, Purdue University bid out replacement components for its Hansen Computer Cluster.⁶⁶ Cisco won the Purdue University competitive bid process by offering a 76% discount off the cost of its products.⁶⁷

While the Legislative Auditor cannot say with certainty that a more open competitive bid process, required wherever possible by West Virginia law, would have resulted in a lower cost for the branch routers purchased by the BTOP grant, it is a basic principal of our free-market

⁶⁴ W. Va. Code §5A-3-30(a).

⁶⁵ California State Government documents.

⁶⁶ Hansen consists of Dell compute nodes with four 12-core AMD Opteron 6176 processors (48 cores per node), either 96 GB, 192 GB, or 512 GB of memory, and 250 GB of local disk for system software and local scratch storage. All nodes have 10 Gigabit Ethernet interconnects and a 5-year warranty.

⁶⁷ Bradreese.com blog <http://www.bradreese.com/blog/8-1-2011.htm>

economy that competition between vendors leads to lower prices and higher quality products. Yet, instead of using an open competitive bid process to attempt to receive the lowest possible price and highest quality product, the State of West Virginia simply relied on Cisco's goodwill.

Recommendations

4. The Director of Purchasing should take action to immediately cease allowing any state purchases to be made through the legally unauthorized secondary bid process.

5. If the Director of Purchasing believes that a secondary bid process should be allowed under West Virginia state law, the Director of Purchasing should request the Legislature to amend the purchasing statutes and legislative rules accordingly.

Appendix A: Objective, Scope and Methodology

This Special Report on the 2010 Purchase of Routers With Broadband Technology Opportunity Program (BTOP) Funds is authorized by West Virginia Code §4-2-5.

Objective

The objective of this report was to examine the Executive Branch's implementation of the federal BTOP grant with regards to the purchase of computer routers.

Scope

This report examined the management of the BTOP grant with regards to computer routers from 2009 to February 2013.

Methodology

This review utilizes information from discussions and correspondence with multiple state agencies and individuals. These include: members of the original Grant Implementation Team still employed by the State, Mr. Jimmy Gianato, Director of Homeland Security and Emergency Management Division and Lt. Colonel Michael Todorovich; the Cisco engineer for the project, Mr. Mark Williamson; Mr. David Tincher, Director of the State Purchasing Division; the present State Chief Technology Officer, Ms. Gale Given; John Dunlap with the Office of Technology; the State Department of Education; the State Supreme Court of Appeals; the State Library Commission; and, the State's former Chief Technology Officer at the time of the purchase of the routers, Mr. Kyle Schafer.